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***What Is Claimed Is:***

1. An isolated DNA molecule comprising a sequence or a partial sequence thereof coding for a chromatin regulator protein, wherein the sequence or partial sequence thereof has a SET domain, and wherein the DNA molecule comprises a nucleotide sequence selected from the group consisting of: SEQ ID NO:1, portions of SEQ ID NO:1, variants of SEQ ID NO:1, mutants of SEQ ID NO:1, SEQ ID NO: 3, portions of SEQ ID NO:3, variants of SEQ ID NO:3 and mutants of SEQ ID NO:3.

2. The DNA molecule according to claim 1, wherein the DNA is a cDNA.

3. The DNA molecule according to claim 2, wherein the DNA is of human origin.

4. The DNA molecule according to claim 1, wherein the nucleotide sequence comprises at least the region coding for the SET domain of *EZH2*, a degenerate variant thereof, or a mutant thereof.

5. The DNA molecule according to claim 4, wherein the nucleotide sequence codes for a dominant-negative mutant of *EZH2*.

6. The DNA molecule according to claim 1, wherein the nucleotide sequence comprises at least the region coding for the SET domain of *SUV39H*, a degenerate variant thereof, or a mutant thereof.

7. The DNA molecule according to claim 6, wherein the nucleotide sequence codes for a dominant-negative mutant of *SUV39H*.

8. A recombinant DNA molecule, comprising the cDNA as defined in claim 2, functionally connected to expression control sequences, for expression in procaryotic or eucaryotic host organisms.

5 9. A procaryotic or eucaryotic host organism, transformed with the recombinant DNA according to claim 8.

10. A recombinant human chromatin regulator protein *EZH2* or a fragment thereof, obtainable by expression of a cDNA as defined in claim 2.

11. A recombinant human chromatin regulator protein *SUV39H* or a fragment thereof, obtainable by expression of a cDNA as defined in claim 2.

10 12. An antisense(deoxy)ribonucleotide with complementarity to a partial sequence of the DNA molecule as defined in claim 1.

13. A transgenic mouse comprising a trans gene for the expression of a chromatin regulator gene which has a SET domain, or a mutated version of said gene.

15 14. A knock-out mouse obtainable from embryonic stem cells in which the endogenous mouse loci for *EZH1* and *SUV39H* are interrupted by homologous recombination.

20 15. A process for identifying mammalian chromatin regulator genes which have a SET domain, or mutated versions thereof, wherein mammalian cDNA or genomic DNA libraries are hybridized under non-stringent conditions with a DNA molecule coding for the SET domain or a portion thereof.

16. An antibody molecule which binds to a polypeptide which contains the amino acid sequence depicted in SEQ ID NO:2.

17. An antibody molecule which binds to a polypeptide which contains the amino acid sequence depicted in SEQ ID NO:4.

5 18. A cDNA molecule comprising the DNA sequence depicted in SEQ ID NO:1.

19. A cDNA molecule comprising the DNA sequence depicted in SEQ ID NO:3.